

Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Indian Camp Creek

Waterbody Segment at a Glance:

County: Warren
Nearby Cities: Wright City
Length of impairment: 0.3 miles
Pollutants: Ammonia, Non-Volatile
Suspended Solids (NVSS)
Source: JZ Landfill



State map showing location of watershed

TMDL Priority Ranking: High

Description of the Problem

Beneficial uses of Indian Camp Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health associated with Fish Consumption

Use that is impaired

- Protection of Warm Water Aquatic Life

Standards that apply

- The Missouri Water Quality Standards (WQS) for ammonia vary depending on the pH and the temperature. As an example of typical limits, the ammonia limits for a General Warm Water Fishery such as Indian Camp Creek (at a pH of 7.8) are 1.2 mg/L (milligrams per liter or parts per million) for summer at 26°C and 2.1 mg/L during the winter at 6°C. The ammonia tables are found in the WQS at 10 CSR 20-7.031 Table B.
- Standards for Non-Volatile Suspended Solids (NVSS) may be found in the general criteria section of the WQS, 10 CSR 20-7.031(3)(A) and (C) where it states:
 - Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
 - Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.

Background Information and Water Quality Data

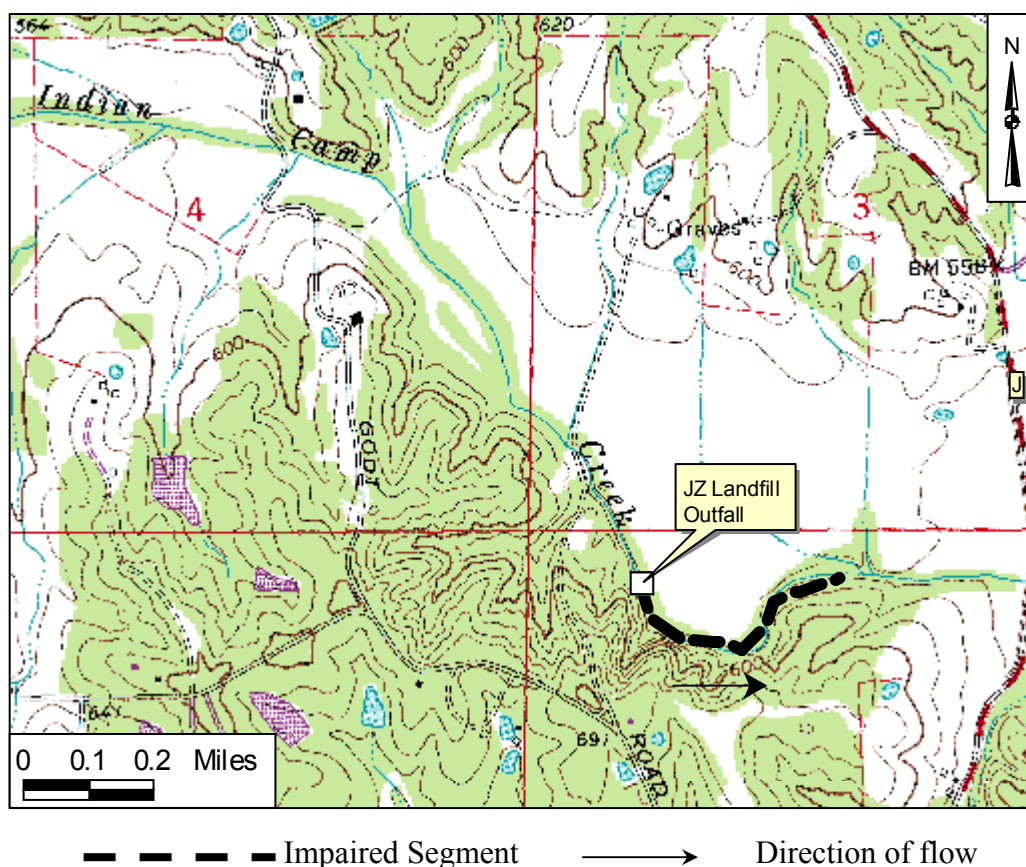
The JZ Landfill is one of three closed landfills that are located on high ground just south of Indian Camp Creek. Leachate emerges from the ground in the vicinity of these landfills and discharges to the

creek. NVSS was considered a pollutant due to observations made in the 1990's of high amount of fine mineral sediments (sand and silt) being deposited in the creek. The Department of Natural Resources conducted a study of sediment deposition in this portion of Indian Camp Creek in the spring of 2004. This study indicated fine sediment deposition rates in the portion of Indian Camp Creek adjacent to the landfills was no greater than other nearby portions of this creek (see Table 1).

Table 1. Percent Fine Sediment (Sand and Silt) in Three Sections of Indian Camp Creek near the JZ Landfill

Location	Percent Fine Sediments
Indian Camp Cr. upstream of all landfills	51
Indian Camp Cr. adjoining the JZ Landfill	30
Indian Camp Cr. downstream of JZ and adjoining other landfills	48

Impaired Segment of Indian Camp Creek in Warren County, Missouri, with Sampling Sites



Landfill leachate is also responsible for elevated levels of ammonia in Indian Camp Creek. An inspection in 1994 indicated a concentration of 57 milligrams per liter (mg/L or parts per million) of ammonia nitrogen in the leachate and 16 mg/L in the stream. These levels are high and under certain conditions can be toxic to aquatic life. Additionally, there was a slight orange color to the leachate and it failed an acute toxicity test. Water quality data for Indian Camp Creek is given in Table 2 below.

This data indicates ammonia values are now much lower than the 16 mg/L recorded in 1994, but may still exceed water quality standards on occasion.

Table 2. Water Quality Data for Indian Camp Creek

Cfs = cubic feet per second; °C = temperature in degrees Celsius; NH₃N = ammonia nitrogen

Site Name	Year	Month	Day	Flow (cfs)	pH	°C	NH ₃ N (mg/L)
Indian Camp Cr. 1mi.above Landfill	2000	8	29				0.02499
Indian Camp Cr. 1mi.above Landfill	2001	8	1	0.1	8.1	32	0.02499
Indian Camp Cr. 1mi.above Landfill	2002	8	8	0.2	8	23	0.02499
Indian Camp Cr. 1mi.above Landfill	2004	3	9		8	7	0.01499
Indian Camp Cr. above Bueneman driveway	2004	3	9		8	7	0.01499
Indian Camp Cr. above Bueneman driveway	2004	3	23		7.3	8	0.01499
Indian Camp Cr. just above Leachate seeps	2004	3	9		8	7	0.01499
Indian Camp Cr. just above Leachate seeps	2004	3	22		7.4	11	1.92
Indian Camp Cr. just below Leachate seeps	2004	3	9		8.2	7	0.14
Indian Camp Cr. just below Leachate seeps	2004	3	22		7.7	7.5	2.83
Indian Camp Cr.at Hwy J	1994	9	29	0.1			16
Indian Camp Cr.at Hwy J	2000	8	29				0.02499
Indian Camp Cr.at Hwy J	2001	8	1	0.6	8	29	0.02499
Indian Camp Cr.at Hwy J	2002	8	8	0.25	7.8	23	0.02499

Note: Ammonia nitrogen values in **bold** print indicate exceedences of state water quality standards.

For more information call or write:

Missouri Department of Natural Resources

Water Protection Program

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